

Spinal deformity in Parkinson disease

Parkinson's disease (PD), as a chronic neurodegenerative disorder of the **basal ganglia**, posture is often affected because the postural reflexes necessary for upright stance and walk are disturbed. Postural instability, which increases with duration and severity of the disease including **gait abnormality**, balance impairments with subsequent falls and fall-related injuries affects the quality of life negatively.

Parkinson's disease (PD) frequently develops postural abnormalities including extreme neck flexion and trunk flexion. Patients with PD sometimes have **osteopenia** and **vertebral** deformity due to the destruction of fragile bone can be also associated with the **spinal deformity**.

Surgery

Inadequate data concerning spinal surgery in patients with PD exist, which report of high complication rates, including multiple reoperations in 86% and construct failure in 29% of patients ¹⁾.

The concepts of **sagittal balance** and alignment are further complicated in patients with neuromuscular diseases such as **Parkinson's disease**, and appreciation of the interplay between anatomic and postural deformities is necessary to properly treat these patients.

Surgical treatment for these patients is very difficult.

Outcome

High rates of mechanical **complications** can necessitate revision surgery. The success of **spinal surgery** in patients with Parkinson disease depends on an interdisciplinary approach, including both surgeons and **movement disorder** specialists, to select appropriate surgical patients and manage postoperative movement in order to decrease mechanical failures. Achieving appropriate correction of **sagittal alignment** with strong biomechanical instrumentation and **bone fusion** is the key determinant of satisfactory results ²⁾.

Case series

Retrospective review of 23 PD patients treated surgically for spinal disorders. Mean ASA score was 2.3 (2-3). Outcome analysis included review of medical records focusing on failure characteristics, complications, and radiographic analysis of balance parameters to characterize special risk factors or precautions to be considered in PD patients. The sample included 15 female and 8 male PD patients with mean age of 66.3 years (57-76) at index surgery and 67.9 years (59-76) at follow-up. 10 patients (43.5%) presented with the sequels of failed previous surgery. 18 patients (78.3%) underwent multilevel fusion (C3 level) with 16 patients (69.6%) having fusion to S1, S2 or the Ilium. At a mean follow-up of 14.5 months (1-59) we noted medical complications in 7 patients (30.4%) and surgical complications in 12 patients (52.2%). C7-sagittal center vertical line was 12.2 cm (8-57) preoperatively, 6.9 cm postoperatively, and 7.6 cm at follow-up. Detailed analysis of radiographs, sagittal spinal, and spino-pelvic balance, stressed a positive C7 off-set of 10 cm on average in 25% of patients at follow-up requiring revision surgery in 4 of them. Statistical analysis revealed that patients

with a postoperative or follow-up sagittal imbalance (C7-SVL >10 cm) had a significantly increased rate of revision done or scheduled ($p = 0.03$). Patients with revision surgery as index procedure also were found more likely to suffer postoperative or final sagittal imbalance (C7-SPL, 10 cm; $p = 0.008$). At all, 33% of patients had any early or late revision performed. Nevertheless, 78% of patients were satisfied or very satisfied with their clinical outcome, while 22% were either not satisfied or uncertain regarding their outcome. The surgical history of PD patients treated for spinal disorders and the reasons necessitating redo surgery for recalcitrant global sagittal imbalance in the sample stressed the mainstays of spinal surgery in Parkinson's: If spinal surgery is indicated, the reconstruction of spino-pelvic balance with focus on lumbar lordosis and global sagittal alignment is required ³⁾.

Case reports

A patient with PD presenting severe trunk sagittal and frontal deformity. The patient had [cauda equina syndrome](#) due to progressive vertebral collapse of the [lumbar spine](#). Kawaguchi et al. performed anterior reconstruction surgery at first in order to achieve improved lordotic alignment of the lumbar spine. Then, he performed 2 posterior surgeries, resulting in total long fusion from T4 to S1. The clinical findings of this patient were presented, and the treatment options were discussed. ⁴⁾

1)

Babat LB, McLain RF, Bingaman W, Kalfas L, Young P, Rufo-Smith C. Spinal surgery in patients with Parkinson's disease: construct failure and progressive deformity. *Spine*. 2004;29:2006-2012. doi: 10.1097/01.brs.0000138306.02425.21. [

2)

Ha Y, Oh JK, Smith JS, Ailon T, Fehlings MG, Shaffrey CI, Ames CP. Impact of Movement Disorders on Management of Spinal Deformity in the Elderly. *Neurosurgery*. 2015 Oct;77 Suppl 4:S173-85. doi: 10.1227/NEU.0000000000000940. PubMed PMID: 26378355.

3)

Koller H, Acosta F, Zenner J, Ferraris L, Hitzl W, Meier O, Ondra S, Koski T, Schmidt R. Spinal surgery in patients with Parkinson's disease: experiences with the challenges posed by sagittal imbalance and the Parkinson's spine. *Eur Spine J*. 2010 Oct;19(10):1785-94. doi: 10.1007/s00586-010-1405-y. Epub 2010 Apr 27. PubMed PMID: 20422434; PubMed Central PMCID: PMC2989214.

4)

Kawaguchi Y, Nakano M, Seki S, Yasuda T, Hori T, Tanaka K, Kimura T. Surgical treatment of lumbar vertebral collapse in a patient with Parkinson's disease: a case report. *Eur J Orthop Surg Traumatol*. 2013 Nov;23 Suppl 2:S165-70. doi: 10.1007/s00590-012-1145-2. Epub 2012 Dec 7. PubMed PMID: 23412270.

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